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Shorter Notes

***Hymenophyllum pilosissimum* C. Chr. (Hymenophyllaceae), a New Recorded Fern from Taiwan.**—Taiwan is one of the most floristically rich areas in the world in its fern composition, which comprise at least 633 species and infraspecific taxa. This kind of high diversity could be attributed to several different reasons including warm and wet weather, altitudinal variation, diverse habitats, and geographical and historical factors (Moore, Diversity and conservation of Taiwan pteridophytes. In: Chow *et al.*, eds., Proceedings of the 2000 cross-strait symposium on biodiversity and conservation pp.331–359. National Museum of Natural Science, Taichung. 2000). Due to the complex topography of Taiwan, many places have never or seldom been visited by fern collectors. This situation has improved because of increased interest in biological diversity by the government and academic sectors since the issue of the Flora of Taiwan (Huang, ed.-in-chief, Flora of Taiwan. 2nd. ed. Vol. I. Editorial Committee of the Flora of Taiwan, Second Edition, Taipei. 1994), and some new recorded ferns and lycophytes were discovered in recent years (e.g., Moore *et al.*, Taiwan J. For. Sci. 17:113–118. 2002; Chang *et al.*, Taiwania 48:197–202. 2003; Moore *et al.*, Taiwania, 48:22–28. 2003; Ebihara *et al.*, Taxon 53:935–948. 2004; Lu and Yang, Taiwania 50:137–165. 2005; Liu and Fraser-Jenkins, Taiwania 51:293–297. 2006; Shinohara *et al.*, Amer. Fern J. 96:96–99. 2006; Chang *et al.*, Taiwania 51:287–292. 2006; Chang *et al.*, Taiwania 52:238–242. 2007; Liu *et al.*, Amer. Fern J. 97:166–173. 2007; Chang *et al.*, Taiwania 54:88–92. 2009; Liu *et al.*, Novon 19:59–61. 2009).

In this article we present another unreported filmy fern, *Hymenophyllum pilosissimum* C. Chr. (Hymenophyllaceae), for the flora of Taiwan. Its taxonomic treatment, line drawings, ecology, phytogeography, and conservation status are reviewed here.

Hymenophyllum pilosissimum C. Chr. in C. Chr. and R. E. Holttum, Gardens' Bull. Straits Settlem. 7: 213. 1934. (Type: Borneo, Kinabalu, *Burbidge s.n.* K!) (**Fig. 1**).

Sphaerocionium pilosissimum (C. Chr.) Copel. Philipp. J. Sci. 67: 33. 1938.

Plant delicate, epiphytic or lithophytic. Rhizomes long-creeping, wiry, widely branched, rootless, but with root-like shoots, terete, glabrous when old, sparsely to fairly hairy when young; rhizomal hairs light-brown, stalked, usually with 1–2 distal branches, hardly to 3 branches, stalks ca. 0.1–0.35 mm long, branches ca. 0.25–0.55 mm long. Fronds 2–14 cm long, 0.8–3.5 cm wide; stipes 0.5–3.5 cm long, wingless on most part, terete, hairy; stipe hairs similar to those on laminae, but only with 2–4 distal branches; laminae 2-pinnate to 3-pinnate-pinnatifid, variable in shape, elliptic, lanceolate, oblanceolate, narrowly lanceolate, narrowly oblanceolate to narrowly elliptic; ultimate

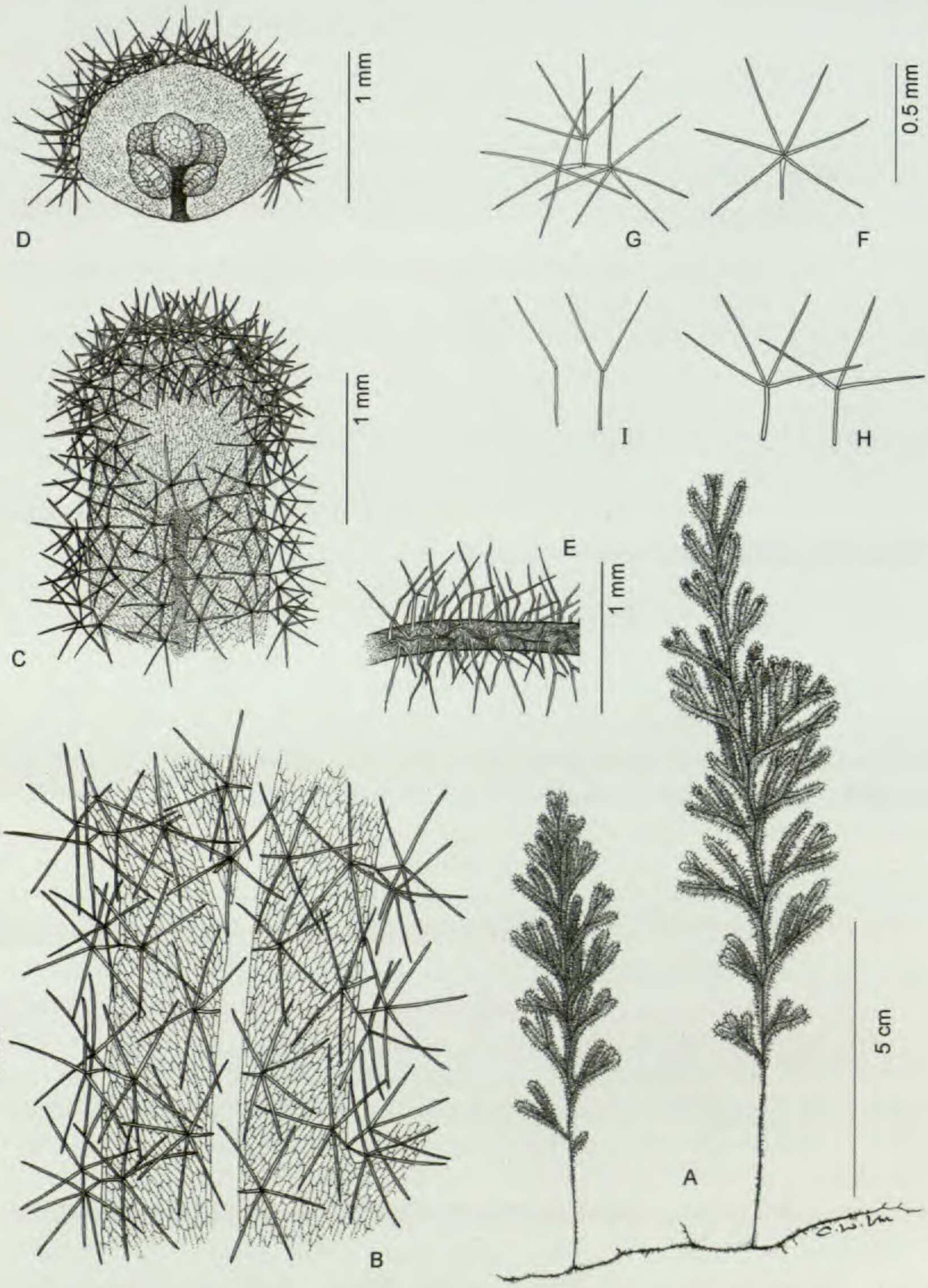

FIG. 1. *Hymenophyllum pilosissimum*: A. habit; B. adaxial surface of lamina; C. fertile segment; D. sorus; E. rhizome; F. simple stellate hair with a stalk on vein; G. 3-tufted stellate hair on laminar margin; H. stellate hairs with fewer branches from stipe; I. hairs from rhizome (all from *Chen s. n.*, TAIF).

pinnules 0.8–1.3 mm wide; laminar hairs light-brown, stellate, with a stalk and 4–6 distal branches, abundant on veins and margins, usually simple stellate hair (Fig. 1F) on veins, 3-tufted stellate hair on margins (Fig. 1G), absent from laminal surfaces, stalks ca. 0.12–0.4 mm long, branches ca. 0.2–0.8 mm long.

Sori on the tips of the upper ultimate segments; indusium bivalate on upper part, with simple, forked or 3-tufted, stalked, stellate hairs on lip margins; receptacle short, included, not protruding.

SPECIMENS EXAMINED.—TAIWAN. **Pingtung/Taitung Hsien:** Chinshuiying to Mt. Kutzulunshan, 22°25′N, 120°46′E, 1500 m, *S. J. Moore 19632,* 23 June, 1997 (TAIF, TNU). **Taipei Hsien**: Wantan, 24°56′N, 121°48′E, 550 m, *C. M. Chen, s. n.,* 25 Aug. 2003 (TAIF).

NOTES.—*Hymenophyllum pilosissimum* is very similar to *H. obtusum* (Hook. & Am.) Copel., a Hawaiian endemic species, but can be distinguished by their laminar hairs, usually with 4–6 distal spreading branches in the former and with 2–3 ascending branches in the latter. It is also similar to the New Caledonian endemic species, *H. subobtusum* Rosenst., but the latter has 3-tufted stellate hairs on veins and wider ultimate pinnules (up to 2 mm).

This species is often placed in genus *Sphaerocionium* (e.g., Copeland, Philipp. J. Sci. 67:1–100. 1938, Fern flora of the Philippines. Vol. I. Bureau of Printing, Manila. 1958; Iwatsuki, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 13:203–215. 1982, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 13:501–551. 1985; Parris *et al.*, The plants of Mount Kinabalu I. ferns and fern allies. Royal Botanic Gardens, Kew. 165pp. 1992). Here we follow Ebihara *et al.* (Blumea 51:221–280. 2006), adopt *Hymenophyllum* as the genus name for this species because of the good support from molecular evidence.

In the protologue, Christensen and Holttum (Gard. Bull. Straits Settlem. 7:191–324. 1934) stated: "The undersurface is throughout covered with stellate hairs which bear....". However, according to the type and our specimens, laminar hairs are confined to the margins and veins. The distribution of hairs on lamina was also confirmed by Iwatsuki (1982), who treated all species with the same characteristic under *Sphaerocionium* subsect. *Sphaerocionium*.

Only two populations were found in northern and southern Taiwan (Fig. 2). The southern population (Pingtung/Taitung) was found on mossy tree trunks of cloud forests at 1,400–1,800 m of elevation. Their fronds are relatively small, usually less than 3.5 cm long, possibly stunted because of the common occurrence of strong winds. The northern population (Taipei) was discovered on rocks on slopes of wet forests of 400–700 m elevation, usually with fronds >5 cm in length.

The species is mainly distributed in Malaysia, including the Philippines (Christensen and Holttum, 1934; Copeland, 1958), Borneo (Christensen and Holttum, 1934; Parris *et al.*, 1992; Ebihara, Mem. Natl. Mus. Nat. Sci. 45:105–110. 2008), and New Guinea (Christensen and Holttum, 1934; Iwatsuki, 1982). The distribution of this species in Taiwan represents its northernmost range.

Hymenophyllum pilosissimum is widely distributed from New Guinea to Taiwan, therefore it should not be regarded as a rare species worldwide. Nevertheless it is a locally rare species in Taiwan. Owing to this rarity, it should be considered a species of concern for conservation, and we suggest that a rank of vulnerable (VU D1 + 2) be assigned to it for Taiwan under the IUCN Red List criteria (IUCN, IUCN Red List Categories and Criteria, Version 3.1. IUCN Species Survival Commission, IUCN, Gland, Switzerland, and

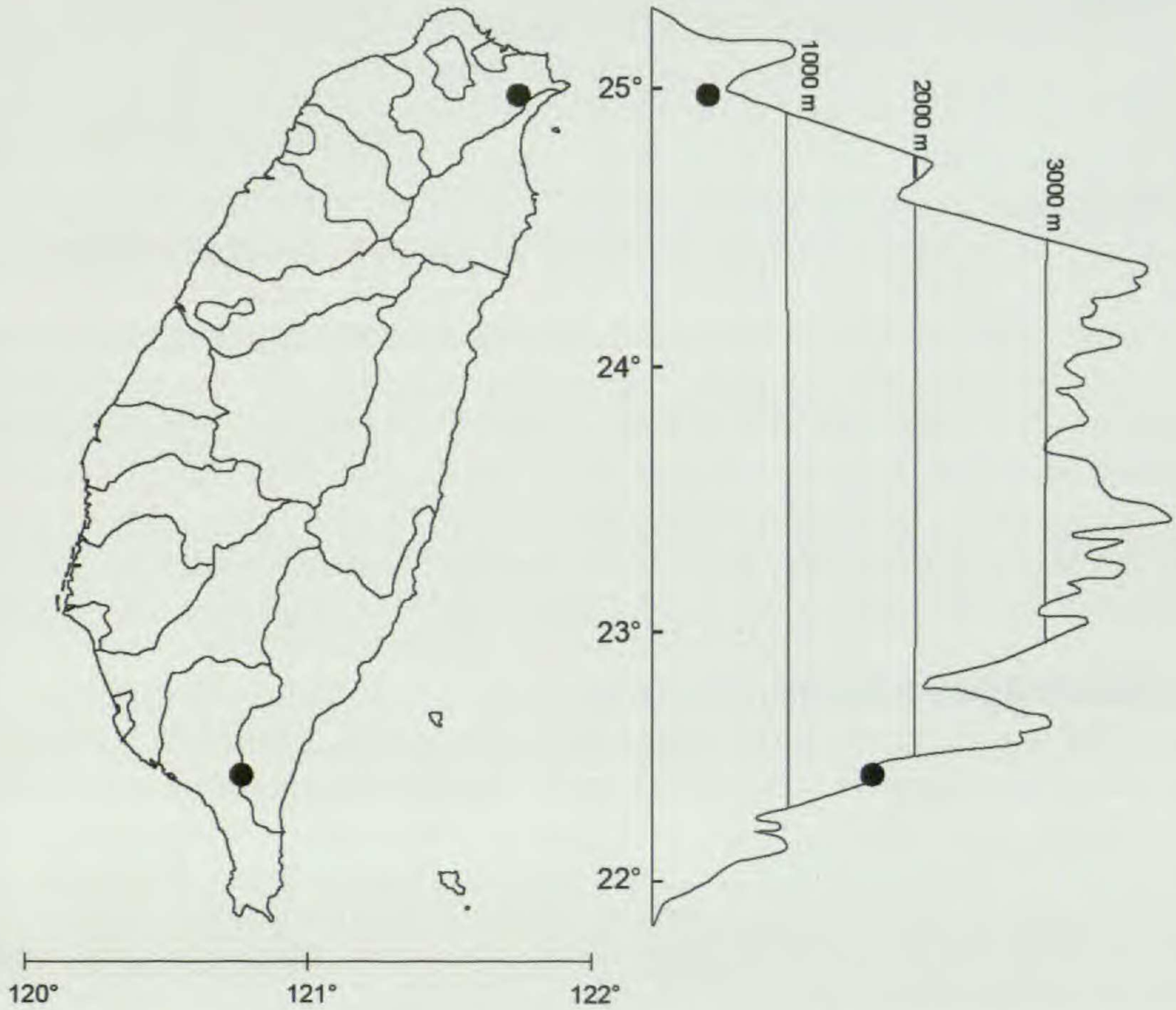

FIG. 2. Distribution map.

Cambridge, UK. 2001) and the guidelines for application of IUCN Red List criteria at regional levels (IUCN, Guidelines for application of IUCN Red List criteria at regional levels: Version 3.0. Species Survival Commission, IUCN, Gland, Switzerland, and Cambridge, UK. 2003).

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New Records of Ferns from Northeastern Argentina and Uruguay.—Four records of ferns are reported here for the first time, two species for northeastern Argentina and two others for Uruguay. In addition, the occurrence of other species is documented with herbarium specimens for both countries. The new distribution records are supported by recent collections done by the authors